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(12) UK Patent Application (19) GB (11) 2 068 853 A

(21) Application No 8004733

(22) Date of filing
13 Feb 1980

(43) Application published
19 Aug 1981

(51) INT CL³ B60B 3/08
21/00

(52) Domestic classification
B7C 21C 21F 5G3

(56) Documents cited
GB 1348891
GB 754903
GB 626282
GB 395150
GB 247285

(58) Field of search
B7C

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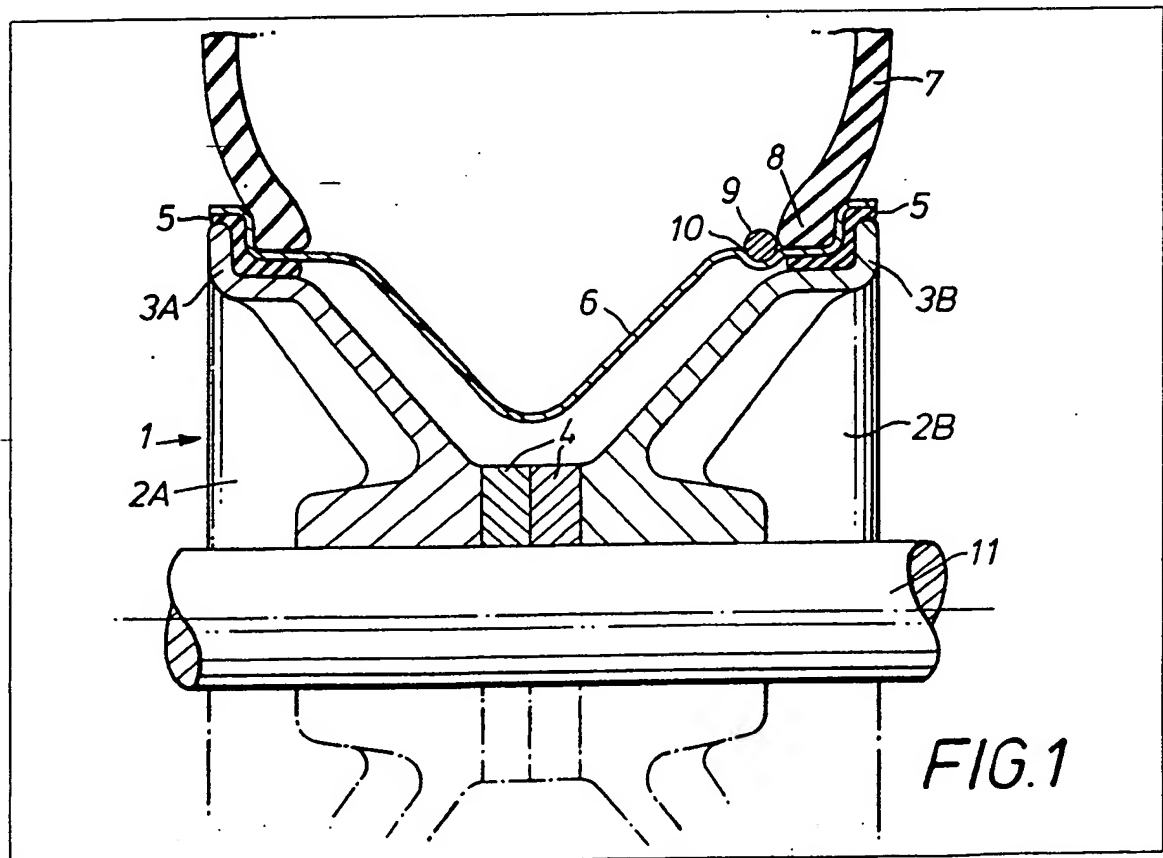
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(54) Vehicle wheel with detachable rim member

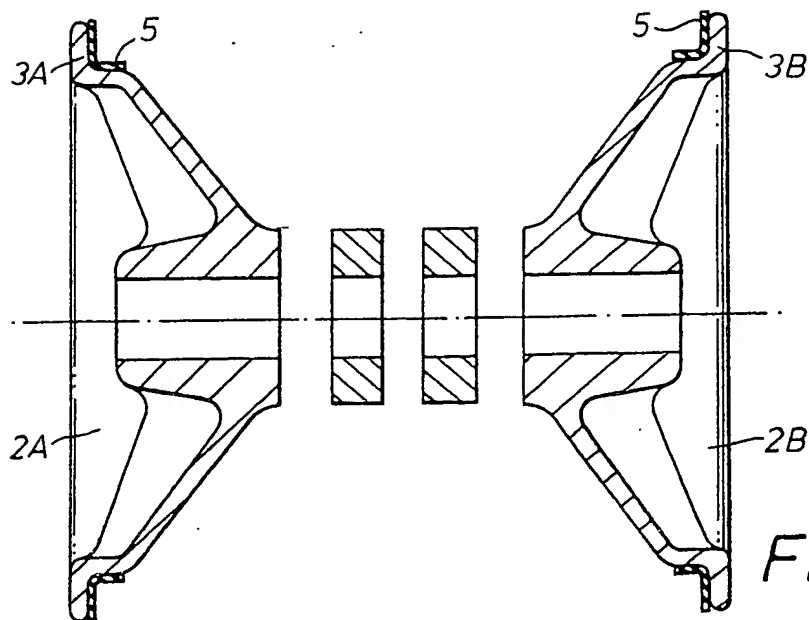
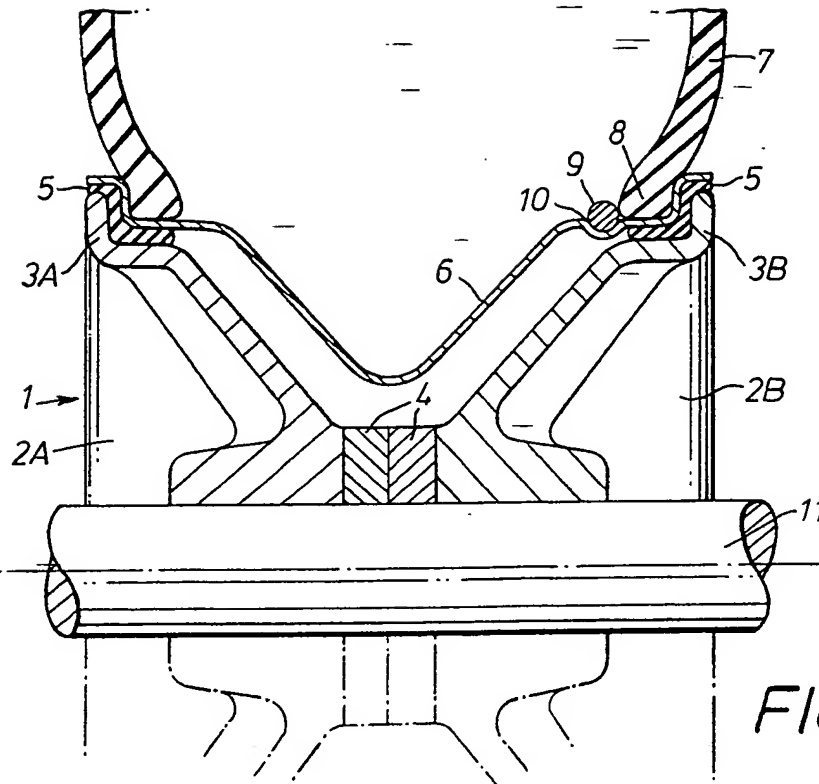
(57) A rim member (6) of annular form, on which a tyre (7) can be fitted so as to be sealed for inflation, is assembled with a vehicle road wheel (1) of split form having inboard and outboard parts (2A, 2B) that can be releasably secured together to hold the rim member (6) in position. Since it is the rim member that seals the tyre, the peripheral parts (3A, 3B) of the wheel do not have to be designed to serve this function.

Torque transfer bands (5) of elastomer are fitted between the parts

(3A, 3B) and the rim member (6). Rim members (6) of different widths can be accommodated by varying spacers (4). The rim member may have a groove (10) containing a ring (9) to prevent dislodgement of the outboard tyre bead (8). The wheel parts (2A, 2B) and rim member (6) may be made of metal alloy or plastics.



The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.



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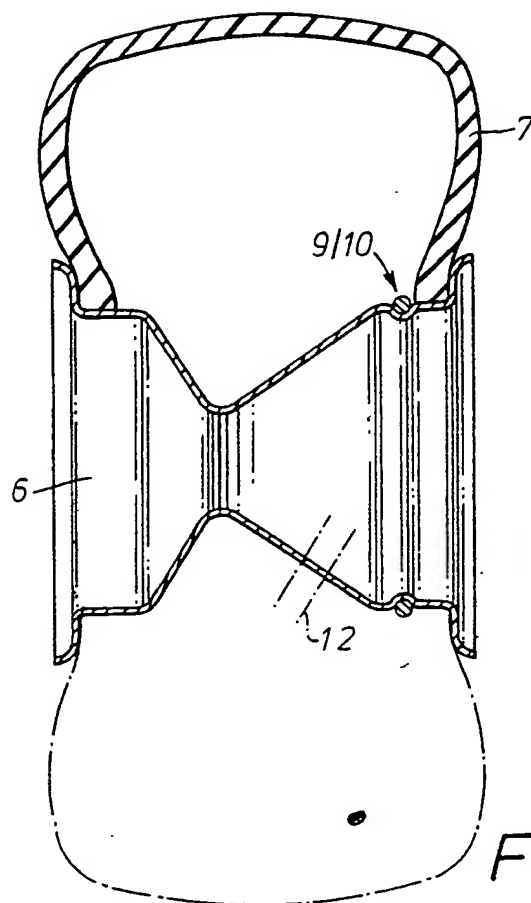


FIG. 3

SPECIFICATION

Vehicle road wheels and tyres

5 This invention relates to vehicle road wheels and tyres.

It is conventional practice to provide a vehicle road wheel to which can be fitted a tubeless tyre, the wheel itself serving to provide the necessary air-tight seal (by the engagement between its rim and the tyre), and being sufficiently stiff to withstand the bending and rotational stresses generated, in use, between the mounting hub, the wheel and the tyre. These functions that the wheel has to perform impose requirements on the structure of the wheel.

According to the present invention there is provided a tyre sealing member of annular form on which a tyre can be fitted so as to be sealed for inflation, the tyre sealing member with a tyre fitted to it being for assembly with a vehicle road wheel of split rim form having inboard and outboard rim parts that can be releasably secured together to hold the sealing member in position around the rim parts. The invention also provides an assembly of a tyre sealing member as just defined and a vehicle road wheel having inboard and outboard rim parts releasably secured together to hold the sealing member in position around the rim parts, the sealing member being releasable from the rim parts by separating these parts. Since it is the sealing member that seals a tyre fitted to it, it can be utilised with a wheel of which the rim parts do not have to be designed to perform this function and their configuration can therefore be chosen to suit the need to retain the sealing member and tyre fitted thereon the rim parts, without consideration being given also to a need to select a configuration that will enable a tyre to be fitted to the wheel without damaging the tyre or the wheel. Furthermore tyre replacement is facilitated since any one of a plurality of sealing members, each fitted to an individual tyre, and preferably already inflated and balanced, can be assembled with any one wheel.

The invention also provides an assembly of a tyre sealing member as defined above and a wheel having inboard and outboard rim parts releasably secured together to hold the sealing member in position and inboard and outboard non-rigid torque transfer bands respectively fitted to the inboard and outboard rim parts and with which the annular sealing member is engaged. The provision of these bands enables the overall weight of the assembly to be minimised.

In order that tyres may be easily fitted, without damage, to the sealing member, and so that the sealing member may be of simple and light-weight construction, the sealing member is preferably provided with a safety

groove adjacent its outboard edge but so as to be within a tyre fitted to the sealing member, within which groove a flexible band is fitted so that a tyre fitted to the sealing member has its outboard bead embraced between this flexible band and the outboard edge of the sealing member. As the band is flexible it can be fitted in position by first stretching it over an edge of the sealing member.

Advantageously replaceable sealing members of different widths are provided, and corresponding spacers are also provided so that an appropriate separation of the inboard and outboard rim parts can be achieved when the rim parts are secured together. In this way different widths of tyres can be simply accommodated.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:—

Figure 1 is a sectional view of one half of a vehicle road wheel and tyre sealing member assembly shown mounted on a vehicle axle and with a tyre fitted to the sealing member,

Figure 2 is an exploded sectional view of the wheel of the assembly of Fig. 1, and

Figure 3 is a sectional view of the sealing member with the tyre.

The wheel 1 shown in Fig. 1 consists of inboard and outboard body parts 2A and 2B that terminate in respective inboard and outboard rim parts 3A and 3B. The body parts, and hence the rim parts, are releasably secured together, for example by bolts (not shown) passed through the central parts of the body parts with, in the form illustrated, the rim parts at a desired separation determined by spacers 4 interposed between the body parts.

Each rim part 3A, 3B, has a non-rigid torque transfer band 5 fitted to it, each of these bands being an interference fit on its rim part. These bands are non-rigid in order to prevent fretting in operation and to achieve a satisfactory interference fit.

The tyre sealing member 6 of the assembly is of annular form and is located around the rim parts 3A, 3B engaged with the torque transfer bands 5. The tyre 7 is fitted to this sealing member 6 with, in the form illustrated, the outboard bead 8 of the tyre embraced between the outerboard edge of the sealing member 6 and a flexible band 9 fitted in a safety groove 10 in the sealing member 6.

The wheel and sealing member assembly 1/6 is mounted on the vehicle axle 11 in conventional fashion (not illustrated), either so as to be removable as a unit, or in a manner such that the inboard body part 2A can remain on the vehicle after the outboard body part 2B and the sealing member 6 with its tyre have been removed.

It will be appreciated that the wheel 1 consists of the body parts 2A, 2B with their rim parts 3A, 3B and the torque transfer bands 5 fitted thereto, and the spacers 4, as shown in Fig. 2, although the spacers 4 can be omitted or replaced by one or more spacers of different width. The tyre sealing member 6 is a separate component the width of which is suited to the spacing of the wheel rim parts. Sealing members of different widths to suit different combinations of spacers, or no spacers at all, can be provided.

As best shown in Fig. 3, the sealing member 6 has fitted to it a tyre 7 before it is incorporated in the wheel and sealing member assembly 1/6. Once the tyre is fitted it can be inflated (the location of the inflation valve is indicated at 12 in Fig. 3) and balanced. Thus a plurality of tyres fitted to sealing members can be prepared for incorporation into wheel/sealing member assemblies 1/6.

As, in use, the sealing member incorporated in the assembly 1/6 is supported by the torque transfer bands 5 the sealing member itself does not have to be sufficiently stiff to withstand the bending and rotational stresses generated between the wheel and the tyre in use. Thus the sealing member 6 can be of light weight construction and hence is of an inexpensive nature. This is particularly advantageous in the field of competitive motoring—where it is desirable for a selection of tyres to be available for fitment to one particular vehicle. As the sealing member is inexpensive a large number of these can have fitted to them a wide range of tyres. A smaller number of wheel/sealing member assemblies can then be prepared utilising whatever selection from this range is desirable on any particular day, cost being minimised because the number of wheel components 2A/2B, 4, 5 utilised overall can be kept to a minimum. A further advantage can be gained that is particularly applicable to competitive motoring if the mounting of the wheel on the vehicle is such that the inboard wheel body part 2A remains in position on the vehicle when the outboard body part 2B is removed to permit replacement of the sealing member and tyre. In this case the track setting remains unchanged when the replacement sealing member and tyre is incorporated into the wheel assembly, unless a tyre of different width is substituted with the spacer(s) 4 therefor appropriately changed (or omitted) to suit the different width sealing member required. In this latter case the track is advantageously automatically modified.

The constructional form of the rim parts can be simplified because these parts do not have to seal the tyre, and hence a tyre does not have to be fitted over them. In a conventional wheel so-called safety humps and ledges are provided with which the tyre beads co-operate so that the tyre is retained on the rim. If these

humps are increased in height to the extent necessary to be effective under competitive conditions there is the danger that tyres will be damaged by over-stretching when fitting them over the humps. The humps can be replaced by so-called safety pegs but the provision of these creates potential leak-points and stress raisers in the rim. None of these measures is required in the present wheel/sealing member assembly as the tyre is fitted to the sealing member and the rim parts 3A, 3B have only to be designed to retain the sealing member in position in the assembly. The tyre during fitting does not have to be stretched over either of the rim parts.

The likelihood of a tyre bead becoming dislodged is mainly relative to the outboard rim and with this in mind there is provided, in the present construction, the safety groove 10 in the sealing member 6 in which is fitted the band 9. As the band is flexible it can be fitted by stretching it over the rim edge of the sealing member.

Suitable materials for various of the components are:

Wheel body parts and rim parts:

Metal alloys or rigid plastics.

Torque transfer bands:

Natural or synthetic rubbers or elastomeric plastics.

Sealing member:

Metal alloys or rigid plastics.

Safety band:

Hollow or solid bands or toroidal springs made of metal alloys or rigid plastics.

CLAIMS

1. A tyre sealing member of annular form on which a tyre can be fitted so as to be sealed for inflation, the tyre sealing member with a tyre fitted to it being for assembly with a vehicle road wheel of split rim form having inboard and outboard rim parts that can be releasably secured together to hold the sealing member in position around the rim parts.

2. An assembly of a tyre sealing member as claimed in claim 1 and a vehicle road wheel having inboard and outboard rim parts releasably secured together to hold the sealing member in position around the rim parts, the sealing member being releasable from the rim parts by separating these parts.

3. A vehicle road wheel and tyre sealing assembly as claimed in claim 2 and further comprising inboard and outboard non-rigid torque transfer bands respectively fitted to the inboard and outboard rim parts and with which the annular sealing member is engaged.

4. A vehicle road wheel and tyre sealing member assembly as claimed in claim 2 or 3, wherein the sealing member is one of a plurality of sealing members that includes sealing members of different widths, and wherein the assembly further comprises inter-

changeable spacers whereby a separation of the rim parts can be obtained to suit any particular sealing member.

5 A vehicle road wheel and tyre sealing member assembly as claimed in claim 2, 3 or 4, wherein the sealing member is provided with a groove adjacent its outboard edge but so as to be within a tyre fitted to the sealing member, within which groove a flexible band 10 is fitted so that a tyre fitted to the sealing member has its outboard bead embraced between the flexible band and the outboard edge of the sealing member.

6 A tyre sealing member of annular form, 15 substantially as hereinbefore described with reference to the accompanying drawings.

7 An assembly of a tyre sealing member and a vehicle road wheel, substantially as hereinbefore described with reference to the 20 accompanying drawings.

Printed for Her Majesty's Stationery Office
by Burgess & Son (Abingdon) Ltd.—1981.
Published at The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.